

THE ANNALS  
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[EIGHTH SERIES.]

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"..... per litora spargite muscum,  
Naiades, et circum vitreos considite fontes:  
Pollice virgineo teneros hic carpite flores:  
Floribus et pictum, divæ, replete canistrum.  
At vos, o Nymphæ Craterides, ite sub undas;  
Ite, recurvato variata corallia trunco  
Vellite muscosis e rupibus, et mihi conchas  
Ferte, Deæ pelagi, et pingui conchyliis succo."  
N. Parthenii Giannettusi, Ecl. 1.

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I.—*Descriptions and Records of Bees.*—LXVIII.  
By T. D. A. COCKERELL, University of Colorado.

*Prosopis palavanica*, sp. n.

♂.—Length about 6 mm.

Robust, black, head and thorax densely punctured, abdomen shining; head broad, clypeus high; large triangular patch on clypeus, confluent with an apical band, lateral face-marks (but no supra-clypeal mark), and narrow stripe on outer side of the short scape all yellow; lateral face-marks filling space between clypeus and eye, abruptly truncate above just below level of antennæ, but sending a narrow band beyond, up along the orbital margin to about level of middle of front; labrum and mandibles black; flagellum stout, submoniliform, very obscure brownish beneath; meso-thorax more coarsely punctured than front; tubercles (but not tegulæ) with a yellow spot; area of metathorax coarsely irregularly wrinkled, the sinuses between the wrinkles shining; tegulæ piceous. Wings greyish hyaline, stigma and nervures piceous; first r. n. meeting first t.-c.; second s.m. much broader than high (as in *P. tagala*, Ashm.). Legs black, anterior tibiæ broadly yellow in front, anterior tarsi

obscurely reddish, the other tarsi dark reddish apically. Abdomen shaped like that of a female, microscopically reticulate, and with fine piliferous punctures, so that the surface does not appear smooth; stipites with long beautifully plumose hairs.

*Hab.* P. Princesa, Palawan (Baker coll. 3853).

*Prosopis taclobana*, sp. n.

♂.—Length about 4.5 mm.

Rather slender, black; head and thorax dull, extremely densely and finely punctured; abdomen also very finely punctured, but somewhat shining; head large and round, the face greatly narrowed below; clypeus and lateral face-marks (abruptly truncate just below antennæ) chrome-yellow, but supraclypeal area black; mandibles and labrum marked with yellow; scape short, broadly yellow in front; flagellum extremely long and slender, not moniliform, obscure brownish beneath; a broadly interrupted band on prothorax, tubercles, and large spot on tegulæ yellow; basal part of metathorax divided by ridges into four large areas, which are themselves finely reticulate, apically between the two midmost areas is a large pit. Wings greyish hyaline, stigma sepia; first r. n. meeting first t.-c., second s.m. about as broad as high. Tibiæ and tarsi rich yellow, anterior tibiæ with a black mark behind, middle and hind tibiæ each with a broad subapical black ring; stipites each with a pair of long stiff yellow bristles, which are hyaline and briefly fimbriate at the end.

*Hab.* Tacloban, Leyte, Philippine Is. (Baker coll. 3665).

The following table separates the Philippine species of *Prosopis*. These are all distinct from those described by Friese from Java:—

Second s.m. about as broad as high; clypeus of male entirely yellow .....	<i>taclobana</i> , Ckll.
Second s.m. much broader (longer) than high ....	1.
1. Clypeus all black; lateral face-marks triangular, broadly truncate above; female .....	<i>tagala</i> , Ashm.
Clypeus with a light spot or patch .....	2.
2. Area of metathorax coarsely wrinkled .....	<i>palavanica</i> , Ckll.
Area of metathorax rugulose, without strong sculpture .....	<i>luzonica</i> , Ckll.

*Trigona palavanica*, sp. n.

Worker.—Length about 5 mm.

Black, without light markings on head, thorax, or legs,

but first dorsal abdominal segment very bright orange-ferruginous, and ventral surface of abdomen apricot-colour; head broad, face grey-pruinose; flagellum obscurely brown beneath, and insertion of antennæ light reddish; mesothorax dull, bordered anteriorly and posteriorly by a band of pale greyish-ochreous tomentum; pleura and sides of metathorax grey-pruinose. Wings brownish, stigma and nervures dark brown. Hind tibiæ and basitarsi greatly expanded; hair on inner side of hind basitarsi dark fuscous, but shining brilliant coppery red when seen from above. Apical segment of abdomen obscure reddish.

*Hab.* P. Princesa, Palawan (Baker coll. 3839).

Related to *T. ventralis*, Sm., but easily known by the bright red base of abdomen. It is quite distinct from the numerous Bornean species tabulated by Cameron.

*Mesotrichia philippinensis*, Sm., var. *chlorina*, v. n.

♀.—Length fully 21 mm., anterior wing 18 mm.

Wings golden green; thorax posteriorly yellow right across; cheeks with a good deal of white hair.

*Hab.* Los Baños, Luzon, Philippine Is. (Baker, 2).

This is much too large for the var. *bilineata*, Friese. Typical *M. philippinensis* ♀ was sent from Malinao, Tayabas (Baker, 3661); this has the iridescence of wings rosy purple and the thorax posteriorly yellow only at sides.

*Xylocopa mimetica*, sp. n.

♂.—Length 24 mm., anterior wing 22, width of abdomen 10.

Black, with all the hair, including that on legs, black; mandibles bidentate; labrum coarsely, confluent punctured, with a basal smooth shining band, which sends a linear process downward in the middle; clypeus coarsely, confluent punctured, with a slight median keel; band on upper border of clypeus, broader contiguous supra-clypeal band, lateral face-marks (filling space between clypeus and eye, and broadly truncate above some distance above level of antennæ), and spot on each side of anterior ocellus all ivory-colour; antennæ black, flagellum (except first joint, which is shining black) brownish beneath, the segments except the last each with an obscure red spot; third antennal joint about as long as next three together. Wings very dark fuscous, anterior wings shining bluish green, violet in region of marginal cell, yellowish green in subapical field, and

pinkish at apex. Abdomen strongly but not densely punctured.

*Hab.* P. Princesa, Palawan (Baker coll. 3834). From the same locality comes a female *Mesotrichia amauroptera* (*Xylocopa amauroptera*, Pérez), Baker coll. 3835.

I understand that the bees from other islands than Luzon were not collected by Professor Baker personally, but by a collector in his employ.

*X. mimetica* is superficially exactly like *M. amauroptera*, though there are important structural differences, not only in the thorax, but also in variation—*e. g.*, the lower section of the basal nervure is much longer than in *amauroptera*.

*X. mimetica* is closely allied to *X. dissimilis*, Lep., but without pale hair on thorax. The abdomen has none of the greenish colour of *X. fallax*, Maidl, while the wings have not the brilliant green tints of *X. auripennis*, Lep. *X. pictipennis*, Sm., from Java, is related, but much larger, with more brilliantly coloured wings.

*Anthophora zonata stantoni*, Cockerell.

Mt. Makiling, Luzon (Baker, 3815); Dapitan, Mindanao (Baker coll. 3844).

Two males, quite alike. The male shows that this form is very close to *A. korotonensis*, Ckll., from Formosa, having the same general characters, including the structure of ventral segments of abdomen. The abdominal bands are a beautiful pearly green.

*Nomada mindanaonis*, Cockerell.

Two females from P. Princesa, Palawan (Baker coll. 3880).

One is smaller than the other and has only two submarginal cells, the second t.-c. being absent; it is apparently only a variation. The larger specimen is larger than the original type of the species.

*Halictus waterhousei*, sp. n.

♀ (type).—Length 10 mm., expanse 19.5.

Black, including legs and antennæ; head rather narrow, cheeks moderate; front and vertex with thin fulvous hair; clypeus strongly and more or less confluent punctured, but shining between the punctures; front dull and rough; thorax above, and at least on upper part of sides, clothed with fulvous hair (matted in the type, which has been in some liquid); mesothorax dull and rough, with dense

small punctures; pleura striate; area of metathorax large, feebly wrinkled; tegulæ rufo-testaceous. Wings strongly greyish, slightly orange-tinted basally, anterior wings suffusedly blackened at apex; stigma ferruginous; first r. n. joining second s. m. near end; outer r. n. and t. c. slender; third s. m. much broader than second, third t. c. with a single curve; femora with pale hair, but that on tibiæ and tarsi nearly all black or dark fuscous, more or less whitish on inner side of hind basitarsi; hind spur with only very minute short comb-like teeth. Abdomen shining black, with black hair, no bands or patches; hair on venter whitish, except apically; first dorsal segment with scattered minute punctures, these in the submarginal region numerous though extremely small; second segment with minute punctures very sparse on disc.

♂.—Length 10 mm., expanse 18.

Like the female, but more slender; clypeus with a very large cream-coloured transverse patch, obtusely angulate in middle above; antennæ very long, entirely black, flagellum strongly crenulate beneath; area of metathorax much more coarsely sculptured, being thrown into coarse irregular wrinkles; first and second abdominal segments slightly glaucous (except depressed hind margins), finely and rather closely punctured all over.

The differences in sculpture of metathorax and abdomen in the two sexes are surprising, but they seem to belong to the same species.

*Hab.* Woodford, New South Wales, Jan. 1909 (*G. A. Waterhouse*). Brit. Museum. The female taken Jan. 24, the male Jan. 31.

Allied to *H. musicus*, Ckll., but entirely distinct by the colour of the tegulæ, the arrangement of hair on thorax, and sculpture of mesothorax and abdomen. The clypeus of *H. musicus* is more shining and less densely punctured.

#### *Halictus pavonellus*, sp. n.

♀.—Length about 4.25 mm.

Head small, nearly circular, dull dark blue-green, the clypeus mainly black; head and thorax with thin white hair; antennæ black, the flagellum ferruginous beneath toward apex; mesothorax and scutellum dull, rich deep blue, rest of thorax very obscure blue-green, posterior truncation (which is well defined) bluer; area of metathorax with fine longitudinal ridges and little cross ones between; tegulæ clear reddish, dark at base. Wings faintly dusky;

stigma short, rufo-piceous, nervures redder; outer t.-c. and r.n. almost wholly invisible, but the shadowy third s.m. very high and short. Femora black, the knees, tibiæ, and tarsi ferruginous, middle and hind tibiæ suffused with dusky. Abdomen dark, with a strong tinge of blue-green or bluish, hind margins of segments piceous, first segment shining, the others duller; a curled scopa of white hair on abdominal venter.

Microscopical characters:—Front lineolate and punctured; mesothorax minutely tessellate and with very minute punctures; tegulæ impunctate; first abdominal segment with excessively minute punctures, the other segments feebly transversely striolate and with very minute piliferous punctures; hind spur with two long blunt teeth.

*Hab.* Bribie Island, Queensland, Nov. 2, 1913 (*H. Hacker*). Queensland Mus. 114.

The following table separates it from its nearest relatives:—

Stigma pale testaceous .....	<i>floralis</i> , Sm.
Stigma dark fuscous or rufo-fuscous .....	1.
1. Apical part of stigma abbreviated; mesothorax dark blue: smaller species .....	<i>pavonellus</i> , Ckll.
Stigma normal; mesothorax dark green: larger species .....	<i>dampieri</i> , Ckll.

### *Halictus callaspis*, sp. n.

♀.—Length about 6.5 mm.

Head and thorax with loose white hair, abundant at sides of thorax; head broad, clypeus prominent, its basal margin little above level of lower ends of eyes; head olive-green, tinged with brassy about bases of antennæ and on supra-clypeal area; clypeus shining peacock-green, its upper margin very narrowly purple; antennæ black, flagellum obscurely reddish beneath toward apex; mesothorax yellowish green, much brighter than head, granular but somewhat glistening, not distinctly punctured; scutellum more shining, peacock-green; rest of thorax rather obscure olive-green; area of metathorax very finely irregularly lineolate; posterior truncation not sharply defined; tegulæ reddish. Wings hyaline, stigma amber-colour; outer r.n. and t.-c. almost obsolete; first r.n. meeting second t.-c. Femora dark olive-green; knees more or less reddish; tibiæ and basitarsi piceous, with much white hair; small joints of tarsi dull ferruginous. Abdomen shining olive-green, without

conspicuous punctures, apical segments with thin white hair, but no hair-bands or patches; venter of abdomen with a white pollen-collecting scopa.

Microscopical characters:—Clypeus with sparse strong punctures; front strongly lineolate; mesothorax minutely tessellate, with sparse very feeble punctures; abdomen finely transversely lineolate, with only piliferous punctures; hind spur with a large blunt tooth and a small rounded one.

*Hab.* Bribie Island, Queensland, Nov. 2, 1913 (*H. Hacker*). Queensland Mus. 109.

The following table separates it from its allies:—

Stigma amber-colour; area of metathorax very finely lineolate. . . . .	<i>callaspis</i> , Ckll.
Stigma dark fuscous or rufo-fuscous; area of metathorax much more coarsely sculptured . . . . .	1.
1. Mesothorax with conspicuous and numerous punctures . . . . .	<i>flindersi</i> , Ckll.
Mesothorax with sparse very minute punctures . . . . .	<i>behri transvolens</i> , Ckll.
Mesothorax with transverse plicæ and no readily noticeable punctures . .	2.
2. Smaller: mesothorax yellowish green.	<i>caloundrensis</i> , Ckll.
Larger: mesothorax bluish green . . .	<i>caloundrensis leucurus</i> (Ckll.).

The last was described as a variety of *H. flindersi*, but it is in reality a variety of *H. caloundrensis*, having the same type of mesothorax.

*Halictus rufotinctus*, sp. n.

♀.—Length 4-4.25 mm.

Robust, with short broad-oval abdomen; head black, with short dull white hair; flagellum dull ferruginous beneath; mesothorax and scutellum olive-green, the mesothorax with a slight coppery shade on each side mesad of parapsidal groove (in var. *a*, the mesothorax is dark blue-green); rest of thorax black, the sides with rather copious white hair; mesothorax dullish, finely and closely punctured, disc of scutellum shining; area of metathorax large, irregularly cancellate; tegulæ castaneous, black at base. Wings hyaline; stigma pale amber-colour; outer r. n. and t.-c. so faint as to be almost obsolete; first r. n. reaching apical corner of second s. m. Legs black, with pale hair. Abdomen broad, dullish, first segment shining; first segment black, second dark castaneous, with a black band across the middle, third and fourth dark castaneous, with a more or less evident

transverse black band ; fifth black, with caudal rima rufescent ; hair of abdomen scanty, no bands or patches.

Microscopical characters :—Face with fine plumose white hairs ; front minutely sculptured, with very fine punctures in grooves ; disc of mesothorax lineolate and finely punctured ; basal part of tegulæ with very fine piliferous punctures ; first abdominal segment and basal half of second very finely punctured ; apical half of second segment minutely transversely lineolate ; hind spur with two large blunt teeth, and a low wave-like one beyond.

*Hab.* Brisbane, Queensland, Oct. 3, 1912 (*H. Hacker*).  
Queensl. Mus. 129.

Related to *H. inclinans*, Sm., but quite distinct by colour of abdomen and legs.

*Halictus subinclinans*, sp. n.

♀.—Length 6.25 mm.

Head broad, black ; mandibles dark reddish in middle ; supra-clypeal area and base of clypeus olive-green ; flagellum short and thick, bright ferruginous beneath except at base ; clypeus short, front dull and granular ; mesothorax dark green, dullish, finely but distinctly punctured ; scutellum rather more shining and more brassy ; rest of thorax black, pleura and sides of metathorax with dull white hair ; area of metathorax large, poorly defined, rugulose, with very short plicæ at sides basally ; posterior truncation poorly defined ; tegulæ rufescent. Wings hyaline, stigma amber-colour ; outer r. n. and t. c. greatly weakened, first r. n. reaching base of third s. m. Legs black, the tarsi obscurely reddish. Abdomen broad, shining brownish black, very finely punctured, hind margins of segments slightly reddish ; apical half with fine pale hair, but no bands or distinct patches.

Microscopical characters :—Supra-clypeal area and base of clypeus with tessellate sculpture and fine scattered punctures ; apical part of clypeus also tessellate and punctate, but the surface more or less undulate and the punctures larger and fewer ; front with the dense punctures tending to run into grooves ; mesothorax tessellate between the punctures ; second abdominal segment sculptured like the apical two-thirds of first, basal part of first with much sparser punctures ; tegulæ impunctate ; hind spur curved, with a single large broadly rounded (subtruncate) tooth and a low broad (wave-like) one beyond.



*Hab.* Launceston, Tasmania, Feb. 15, 1914 (*F. M. Littler*, 2568).

Allied to *H. inclinans*, Sm., but easily distinguished by the greater size, darker tegulæ, and dark legs. It appears to be the Tasmanian representative of *H. inclinans*.

*Halictus (Chloralictus) busckiellus*, sp. n.

♀.—Length about 4 mm.

Head and thorax dark green, abdomen black, hind margins of segments obscure reddish; mandibles dark castaneous, black at base; flagellum dull ferruginous beneath; tegulæ rufo-fuscous. Wings rather short, greyish hyaline, stigma dusky reddish. Legs black, tarsi reddish apically. Hair white, rather abundant on cheeks, pleura, and apical segments of abdomen. Head broad, its width 1.3 mm.; clypeus not much produced, shining, sparsely punctured, the punctures on basal half smaller and closer than those on apical, and nearly all emitting hairs; supraclypeal area minutely tessellate, with extremely minute scattered piliferous punctures; front very delicately roughened, with a microscopically reticulate sculpture, the middle portion minutely punctured, the intervals between the punctures crossed by lines; mesothorax dullish, minutely tessellate, with scattered extremely minute punctures; tegulæ impunctate; area of metathorax with a fine file-like striation, the striæ very oblique at sides; abdomen shining, minutely transversely lineolate; first r. n. meeting second t.-c.; second s.m. small, third s.m. large and broad, nearly or quite twice as broad above as second; hind spur with about three long teeth.

*Hab.* Island of S. Domingo, West Indies, 7. 8. 05 (*Aug. Busck*). U.S. National Museum.

Allied to the Cuban *H. parvus* (Cresson), but the face is only thinly hairy, the tegulæ are darker, sculpture of front is different, mesothorax is duller, and scutellum is not polished. *H. plumbeus*, Ashm., is readily separated from *H. busckiellus* by the narrower face and more strongly and closely punctured front; *H. jamaicæ*, Ellis, is separated by the lighter tegulæ, red knees, and mainly red tarsi, as well as the closely punctured sides of front.